

## Need for R&D in Finland

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## Previous R&D-projects on soil treatment

- In Finland several monitoring projects dealing with onsite wastewater treatment has been done. In 1998-2001 Hajasampo-project was the first big one, but the results were published only in Finnish. Some conference papers has been made. Based on the Ravinnesampo-project (2002-2005), a paper presented in an IWA Conference in Mexico (2006) was later published in Water Science & Technology (Vilpas, R. & Santala, E.: Comparison of the nutrient removal efficiency of onsite wastewater treatment systems, Water Science & technology Vol 55 No 7 pp 109-117, IWA Publishing 2007). Comparison was done between several different sand filter systems and SBR plants.

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## Present R&D activity in Finland

- MASU-project (Eco-efficient solutions for wastewater treatment in rural areas) includes following:
  - monitoring several sand filter systems on site
  - monitoring laboratory scale ( about 1\* 1\*1 meter) sand filters with different filter media
  - Sampling both for BOD,P,N as well as bacteria and viruses
  - LCA-analysis of sand filters vs. package plants
  - Analysis of heavy metals and hygienic indicators at abandoned sand filter systems
  - Cultivation experiments with the sand taken from abandoned sand filters
- Some ongoing projects include monitoring the function of sand filters in normal use

  
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## Intresting and important topics for possible cooperation in R&D activities

- Determining influent parameters for raw domestic wastewater before pretreatment in a septic tank (for testing purposes)
- Determining influent parameters for greywater before any pretreatment (for testing purposes)
- Development of practical means to measure influent and effluent volumes on site for control and supervision purposes
- Utilization of different geological maps for planning and designing soil treatment systems

  
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- The effect of low temperature for soil treatment systems, especially for those serving such holiday homes that are used intermittently in winter
- The proper means for frost isolation of soil treatment constructions
- Functionality research comparisons with different sand filters:
  - Monitoring in laboratory using full scale pilot systems
  - Monitoring a typical sand filter on site with plastic-lined bottom
  - Monitoring a typical sand filter on site with no bottom lining



- Which parameters should be analyzed when studying influent and effluent: BOD, COD, TOC, SS, P, N, pathogens, organic pollutants, heavy metals etc.?
- The effect of P-removal by precipitation before soil treatment, recent experiences?
- Comparison of the P-adsorption capacity of different sand minerals existing in the Nordic countries (the effect of physico-chemical properties, grain size distribution and grain forms)

